



USDA Forest Service - Southern Research Station - 320 Green Street Athens GA 30602 - <http://www.srs.fs.fed.us/disturbance>



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## Outreach Activities:

- Five organized groups with a total of 62 people toured the Brender Demonstration Forest during May. These groups included the Forest Service and Georgia Forestry Commission FIA crew, there for a training session, Boy Scout Troop 170 from Macon, employees from the US Forest Service Oconee District and Chattahoochee-Oconee Forest Supervisor's offices, the Red Cross, and school teachers attending the Project Wild Course sponsored by the Department of Natural Resources.

- Approximately 45 visitors came by the office at Brender Forest for information and 75 people signed the register at the Hitchiti Interpretive Trail. Some of these visitors came from as far away as Denmark, Vermont, Louisiana, and Montana.



Taking a break at the Eastfire Conference, Stephanie Laseter, Coweeta, John Stanturf, and Gary Achtemeier, Athens

## Technology Transfer:

- Alex Clark attended the AF&PA-Agenda 2020 Wood and Wood Composites Research Committee Meeting in Madison, Wisconsin. The purpose of this annual meeting, hosted by the Forest Products Laboratory, is to review and coordinate research on wood properties and wood composites. Alex presented an update on the wood quality research being conducted by RWU-4104.

- Gary Achtemeier, Scott Goodrick, Yongqiang Liu, and John Stanturf attended and presented a total of 14 papers at the Eastfire Conference on Remote Sensing and Fire, held at George Mason University in Fairfax, VA. These included:

- "Eastern states demographics and the wildland urban interface" John Stanturf, Michael Wimberly (UGA) and David Wear (invited);
- "Interactions between a wildfire and sea breeze front" Deborah Hanley (FLDOF), Phil Cunningham (FSU), and Scott Goodrick;
- "Smoke plume behavior—what the data say" Gary Achtemeier and Luke Naeher (UGA);
- "Numerical modeling of horizontal vortices forced by wildland fires" Scott Goodrick and Phil Cunningham (FSU);
- "Bridging EOS remote sensing measurements and fire emissions, smoke dispersion, and air quality DSS in the Eastern US" John Qu, Xianjun Hao, Ruixin Yang, Swavvanu Dasgupta, Sanjeeb Bhoi, and Menas Kafatos (GMU), Yongqiang Liu, Gary Achtemeier,

and Al Riebau (USFS), and Patrick Coronado (NASA);

- "Florida's Fire Management Information System" Jim Brenner (FLDOF) and Scott Goodrick;
- "Simulation and experiment of air quality effects of wildland fires in the Southeast" Yongqiang Liu, Gary Achtemeier, and Scott Goodrick;
- "A coupled modeling system for connecting prescribed fire activity data through CMAQ for simulating regional scale air quality" Gary Achtemeier, Scott Goodrick, and Yongqiang Liu;
- "Effects of fire on forest soils and potential remote sensing applications" John Stanturf, Yongqiang Liu, Ralph DiCosty, and Mac Callahan;
- "High resolution numerical models for smoke transport in plumes from wildland fires" Phil Cunningham (FSU) and Scott Goodrick (poster);
- "Improving fire emission estimates in the Eastern United States using satellite-based fuel loading factors" Yongqiang Liu and John Qu, Xianjun Hao, and Wanting Wang (GMU) (poster);
- "Spatial modeling of weather parameters for fire danger rating system using artificial neural networks" Scott Goodrick (poster);
- "Burned area mapping in eastern United States using MODIS measurements" Xianjun Hao and John Qu (GMU) and Yongqiang Liu (poster).



- Yong Liu and John Stanturf served in other ways at the Eastfire Conference: Yong was on the technical committee and moderated a session on remote sensing and modeling applications for fuel treatments. John served on an expert panel that wrapped up the conference.

- Mac Callaham attended the Soil Ecology Society meetings, held at the Argonne National Laboratory near Chicago and presented a poster entitled “Tracing 14C labeled leaf litter through oak-hickory forest soils with native or introduced earthworms” which contained preliminary data from work underway with colleagues at Oak Ridge National Laboratory. The poster generated a level of unexpected interest.

- Tom Waldrop was an invited speaker at the Fire in Southern Appalachians Workshop, held at the Coweeta Hydrologic Lab.

- Alex Clark, Co-Director of the Wood Quality Consortium, helped organize and host the Annual Meeting of the Consortium held in Athens. John Stanturf also attended. It appears that the Consortium will continue beyond this year, with 10 companies expressing an interest in a new program of work. Alex made two presentations, one entitled “Effects of rotation length and rate of growth on loblolly pine wood stiffness and strength,” and the second “Effect of age and geographic location on weight per cubic foot of planted loblolly pine.”

- Gary Achtemeier was quoted in an article in the June issue of *National Geographic*, “Fire and Rain—forecasting the chaos of weather.” Gary’s work on superfog was mentioned, along with fire behavior simulations by cooperators Phil Cunningham at Florida State and crystal-ball-gazing predictions from Al Riebau of the Washington Office R&D staff.



*Old Norway spruce (Picea abies) forest in northern Carpathian Mountains, Romania.*

- John Stanturf participated with the Danish Regeneration Commission in a field visit to Romania to observe methods of managing and regenerating European beech and natural Norway spruce forests. Members of the



*Dense young stand of European beech (Fagus sylvatica) in Romania.*

Poul Arne Madsen, Store Hjælland Plantage, private family-owned conifer plantation; Søren Honoré, Skov- og Naturstyrelsen, Danish Forest and Nature Agency; and Niclas Scott Bentsen, Skov- og Landskab. The commission’s remit is research, development, and implementation of new cost-effective regeneration methods. Pre-commercial thinning is included as part of the regeneration stage. Impetus for this work was the several devastating winter storms in the last 10 years and the current and projected deteriorating economic conditions for wood production in Denmark. We were hosted by Dr. Norocel-Valeriu Nicolescu, Professor of Silviculture in the Faculty of Silviculture and Forest Engineering at the University of Transylvania in Brasov; and by Dr. Ion Barbu of the Forest Research and Management Institute, Campulung Moldovenesc in Bukovina. The Romanian Forest Service, ROMSILVA, furnished a van and driver for the week and all the field sites were on ROMSILVA land. Until the fall of the Ceacesecu regime about 15 years ago, all the forest land was owned by the central government. The restitution process currently underway will return over half the forest land to former private owners; other former owners, such as the former ruling family, will receive financial restitution instead of land. Two primary lessons learned on the trip were that it is possible to obtain more advance regeneration of desirable species than is optimal, and it is possible to be too proactive in early stand tending. The highlight of the trip was visiting two “primeval” forest reserves, untouched for at least 200 years.

- Mac Callaham gave an invited seminar detailing his research program to the Department of Evolution, Ecology, and Organismal Biology at Ohio State University in Columbus. He was hosted by Ralph Boerner. Callaham is serving on the advisory committee for one of Boerner’s graduate students at OSU, Carla Gia. Carla is also studying earthworms for her dissertation research. She will sample the Fire and Fire Surrogates plots in southern Ohio, in order

to determine whether management affects earthworm populations.

- During his visit to Ohio, Callaham met with two faculty members at the Marion campus of Ohio State, Bob Klips and Rich Bradley. Klips and Bradley have long been involved in a prairie restoration project on the campus and have several research projects underway. Mac received the grand tour of the restored prairie and suggested that the ongoing research be modified to include some survey of the earthworm fauna at the site (of course!).

- Kenneth Outcalt and Michelle Cram, State and Private Forestry, met with John Maitland, Forest Manager at Ft. Jackson, South Carolina, his staff, and the wildlife resources staff, to diagnose causes of pine mortality. Outcalt looked at recently prescribed burn areas, evaluated their burning program, and offered technical input into possible causes of mortality and how to minimize it when burning longleaf pine stands. He provided a follow-up written report of the visit and relevant publications to assist them in restoring their longleaf pine stands.

- Outcalt attended a tour with Michelle Cram and Forest Management and Fire staff of Savannah River Forest Station, South Carolina. They looked at prescribed burn study areas and offered technical input into likely causes of longleaf pine mortality. He also offered guidance on how to determine if delayed mortality is likely following prescribed burns and thus which stands require further observation for potential salvage operations.



*Ken Outcalt looking at root damage from smoldering duff fire at Ft. Jackson.*



*Ken Outcalt evaluating tree mortality from prescribed burning at Ft. Jackson.*



## Meetings/Reports:

- Scott Goodrick and Ken Forbus attended a workshop on Bluesky/RAINS, hosted by EPA in Raleigh.
- Ken Outcalt has scheduled a meeting on fuels treatments and longleaf pine restoration to be held at the Solon Dixon Center near Andalusia, Alabama. Date for the meeting is October 20, 2005.
- Joe O'Brien met with staffs of the Forest Service International Program and The Nature Conservancy in Washington, DC to discuss ways to streamline technical assistance activities for the Latin American and Caribbean Fire Initiative. Present at the meeting were Liz Mayhew, Forest Service Latin American Program Manager, Dana Roth and Margaret Haines, both Latin American Program Specialists, and Ron Myers, Senior Fire Ecologist with The Nature Conservancy. The meeting successfully resolved several issues that had arisen due to nuances in budgeting and the inherent lags and difficulty in foreign work.

## Partnerships:

- Joe O'Brien has been offered the position of Latin American Fire Initiative Co-Manager, specifically to ensure the meshing of the Forest Service and TNC activities in the region and to suggest future directions for technical cooperation on fire management in Latin America.
- Gary Achtemeier and Scott Goodrick prepared a Memorandum of Understanding (MOU) with the Florida Division of Forestry (FLDOF) to share their fire activity data. These data are critical for the development of regional air quality models. The MOU will be submitted to SRS as soon as a signed copy is received from FLDOF.
- A Research Joint Venture Agreement (RJVA) has been approved with Richard Watson to conduct Arizona Ecological Mapping Project, funded by National Park Service; Dave Cleland is the unit scientist who initiated the project.
- A cooperative agreement has been prepared with Phil Cunningham, Florida State University, to conduct "Advances in the understanding of fire behavior and smoke transport using high resolution numerical models" that will be funded by the NRI grant to Scott Goodrick.
- A cooperative agreement with Tom Mote, University of Georgia, has been submitted to support Southern High Resolution Modeling Consortium activities; this work is funded by an EPA grant to Gary Achtemeier.

## Science Highlight:

The connection between disturbance and invasive species likely will be a critical area of research for the unit in years to come. Kim Crider is currently working toward a Ph.D. at the University of Montana, looking at the effects of disturbance (fire and logging) and biological control agents on the population dynamics of an invasive plant (tansy ragwort, *Senecio jacobaea*). Tansy ragwort is native to Europe and Asia and is considered an invasive species in North America. It was first identified in the United States in Oregon in the early 1900s. Since this time, despite relatively successful control of the species in Oregon, tansy ragwort has spread eastward to Idaho and Montana. Tansy ragwort is known to compete with native plants and proliferate in areas with frequent disturbance. Additionally it is toxic to wildlife and livestock, and is thus of high concern in areas that are regularly grazed.



Tansy ragwort only recently has become a problem in Montana, first discovered in 1996 following the 1994 Little Wolf wildfire in the Little Wolf Creek drainage in Lincoln and Flathead Counties in northwest Montana. An aerial herbicide control program was immediately implemented, followed by the release of three biological control insects beginning in 1997 in Flathead National Forest (Flathead County), while populations in Kootenai National Forest (Lincoln County) were not as intensively managed. By 2000, managers reported a sharp decline in the infestation of tansy ragwort on Flathead National Forest, and control emphasis shifted to the Kootenai National Forest.

Biological control has been the main focus of management efforts in northwest Montana. The basic idea behind biological control is to introduce an insect known to control a plant in its native range to the plant's introduced (invasive) range in an attempt to control the species. Due to the ecological risks associated with introduced species in general, potential introduced biological control organisms must be rigorously tested to ensure they will have low impacts on native species but high impacts on the target invasive species. Although biological control has been effective in controlling invasive plants, there are very few documented cases of success. Too often, release and monitoring of the biological control agents themselves are the focus of research but effects on their invasive targets are rarely documented. Furthermore, such effects are rarely quantified at the population level; damage to individual plants may be quantified but that gives little indication of the reduction to the invasive potential of the species at a larger scale.

Kim's research will quantify the effects of two biological control agents, the cinnabar moth and the ragwort flea beetle, on the population growth rate of tansy ragwort in areas with different disturbance histories. Managers in the area believe that the cinnabar moth plays an important role in controlling these tansy ragwort populations, but this observation has not been quantitatively verified. The project is designed to answer the following questions:

- Are biological control agents affecting growth and expansion of tansy ragwort populations?
- Are both biological control agents (insects) necessary, or would it be more economical to focus on the establishment of one or the other?
- What habitats are more likely to facilitate the growth and expansion of tansy ragwort populations in terms of prior disturbance such as harvest, wildfire, and grazing?
- How do biological controls differ in their impacts between these types of habitats?

Demography is one way to quantify the effects of biological control and habitat on plant populations, by following marked individual plants through their entire life cycle. This approach will give an idea of which life stages are most important to the plant's invasive potential. By combining rates of recruitment of seedlings, seed production, and juvenile rosette survival we can construct a life stage transition model to project population size and growth rate into the future under similar conditions. This approach is extremely useful for invasive species because it allows us to predict the potential "invasiveness" of a particular species in areas with and without biological control agents and in habitats with different disturbance history, allowing managers to better plan eradication strategies and management activities to reduce or prevent the spread of particular species. At the completion of this work, Kim hopes to offer a management prescription for tansy ragwort in Montana, expand general ecological knowledge about plant-

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insect interactions and population dynamics in disturbed, non-native habitats, and bring needed skills back to the unit and Southern forest ecosystem studies.



## Visitors

- Shertia Love, Graphic Designer at Office of Instructional Support and Development, University of Georgia, consulted with Pat Outcalt on new design features of software programs.



*Shertia Love and Pat Outcalt looking over changes in design software.*



*Leslie Wolcott*



*Mezelle Moore*



*Ben Hornsby*



*David Chastain*

## Funding:



- Susan Bennett, student worker with Mac Callaham, received a National Science Foundation Research Experience for Undergraduates Award. Through the award she will be provided the opportunity to conduct a research project of her own devising, under the guidance of Paul Hendrix (UGA) and Mac Callaham.

## Personnel News:

- Jason O'Shell, Forestry Technician in the Coastal Plains Fire Team at Myakka River State Park, has secured a new permanent position. He and his family are moving back to Tennessee, where he will be working for the State Division of Forestry. They are getting a great employee. His last day with the station will be June 30. We wish him the best in his new job.

- Welcome to new student workers Leslie Wolcott, working with Joe O'Brien on the BMP Pine Flatwoods and Rocklands project funded by JFSP; Mezelle Moore, working with John Stanturf on various soils projects; Ben Hornsby, returning to work with Alex Clark on Wood Quality Consortium studies, and newcomer David Chastain. Student workers joining the Clemson team include Jeffrey Vissage, Tyler Jones, Caleb Bagwell, James Douglas, and the returning Horace "Eddie" Gambrell.

## Visitors

- Graeme Lockaby, Professor of Forestry and Associate Dean for Research at Auburn University, will visit John Stanturf on June 23rd.

- It's good-bye to student workers Erin Kallmann, Andrea Leach, and Brad Pounders.

- Ken Forbus attended training on new Environmental Science Research Institute (ESRI) GIS products at the remote sensing center in Salt Lake City. According to Ken, ESRI has made great strides integrating their products.



• Deanna J. Stouder has been named the National Director of Wildlife, Fish, Watershed, and Air Research in the Washington Office. Since 2003, Stouder has served as Assistant Director for the agency's Watershed, Fish, Wildlife, Air and Rare Plants staff within the National Forest System Deputy area. She joined the Forest Service in 1998 as the Program Manager of the Aquatic and Land Interactions Research and Development Program at the Pacific Northwest Research Station in Portland, Oregon. Stouder received her Doctorate in Ecology from the University of Georgia, Athens, in 1990. She also holds a Master's in Biology and a Bachelor's in Aquatic Biology from the University of California at Santa Barbara.

• Luban Dimov will join the forestry faculty at Alabama A&M University; Luban recently received his Ph.D. from Louisiana State University.

• Directors have been named for the newly established Eastern Forest Environmental Threat Assessment Center (EFETAC) and Western Wildland Environmental Threat Assessment Center (WWETAC). Danny Lee has been chosen for the EFETAC; he will report June 27th to the SRS Headquarters in Asheville, NC. Danny comes from the Pacific Southwest Research Station, where he is currently a Research Ecologist/Project Leader whose personal research included comparative risk assessment. Jerome (Jerry) Beatty has accepted the position of Director of the WWETAC, located in Prineville, OR and co-located in the Forest Supervisor's Office of the Ochoco National Forest. His effective date is July 18. Currently he is Deputy Director, State and Private Forestry, Forest Health Protection, in the Washington Office. The role of the Center Directors is to advocate science and the scientific method in developing a comprehensive early warning system to predict, detect, and assess environmental threats to forest and rangelands.

• Dave Holland, formerly Deputy Regional Forester in Region 8, has retired as Director, Recreation, Heritage, and Wilderness Resources staff in the Washington Office.



• The Louisiana Governor's Science Working Group and Advisory Panel have

released its report "Conservation, Protection and Utilization of Louisiana's Coastal Wetland Forests." Some of the conclusions reached by the Science Working Group are that the functions and ecosystem services of Louisiana's coastal wetland forests are threatened by both large- and small-scale hydrologic and geomorphic alterations and by conversion of these forests to other uses. Subsidence, sea-level rise, and levee construction are the large-scale hydrologic and geomorphic alterations responsible for the loss of Louisiana's coastal wetland ecosystems, including coastal wetland forests. Regeneration (both natural and artificial) is a critical process of specific concern in maintaining coastal wetland forest resources. The report is available at [http://www.coastalforestswg.lsu.edu/SWG\\_FinalReport.pdf](http://www.coastalforestswg.lsu.edu/SWG_FinalReport.pdf). Also check out the Science Working Group website, which was established to inform the public of the activities related to Louisiana's Coastal Wetland Forests; <http://www.coastalforestswg.lsu.edu/>.



*Lightning cause fire Kootenay National Park, Canada.*



*Arson fire in Annalong, County Down, Ireland destroyed almost 150 acres. About 70 firefighters were involved in tackling the blaze*

• Wildland fire continues to be an issue worldwide. Recent news articles describe outbreaks in boreal Canada, southern China, and arson fires in Israel and Ireland. US experts are forecasting a bad fire season in the western US and Alaska, in part due to a wet winter and spring that caused luxurious growth of grasses that provide fine fuels to carry fires. A bad fire season is expected in boreal Russia also, continuing the trend of

increasing area burned. According to an article in *The Independent*, the increase in forest fires in Siberia is partly due to arsonists exploiting the system of logging licenses. If forest land is burned over, the logging license is cheaper, although there may have been little damage to overstory trees. Large fires in Siberia are more than a local problem, however, as smoke has been transported across the Pacific Ocean and affected air quality in Seattle. Last June, ground-level ozone in Seattle exceeded EPA health limits, in part because of the Siberian fires.

• Mountain Lumber of Ruckersville, VA has purchased Madison Wood Flooring in order to meet the growing demand for historic and recycled wood flooring. Mountain Lumber rescues timbers from buildings being taken down around the world and mills them into flooring, beams and architectural details. The business centers around Historic Heart Pine® and Antique American Oak reclaimed from century-old mills up and down the East Coast of the US as well as chestnut that had been previously used in Appalachian barns. Other more exotic Mountain Lumber finds include ancient Chinese Elm saved from 15th Century Ming Dynasty buildings, reclaimed hundred-year-old English "Cooper's Oak" and Russian Oak. Another approach is to recycle wooden pallets, work pioneered by the Forest Products Conservation unit of the Southern Research Station unit in Blacksburg, Virginia; <http://www.srs4702.forprod.vt.edu>. This work is being commercialized by another company, Oaks Unlimited of Waynesville, North Carolina. <http://www.oaksunlimited.com/>

• MeadWestvaco Corporation completed the sale of its Papers business and associated assets for \$2.3 billion to NewPage Corporation, a new company controlled by Cerberus Capital Management L.P., a private, New York-based investment firm. Under the terms of the transaction, NewPage acquires MeadWestvaco's writing and printing papers business, which consists primarily of mills located in Chillicothe, Ohio; Escanaba, Michigan; Luke, Maryland; Rumford, Maine; and Wickliffe, Kentucky. The sale also includes approximately 900,000 acres of forestlands in Illinois, Kentucky, Michigan, Missouri, Ohio and Tennessee, which provide wood to these mills. NewPage will discontinue research on cottonwood begun by Westvaco at the Wickliffe mill.



FY 2005 Publications: (\*denotes new publication this month)

### Refereed Journals and Book Chapters

**Achtemeier, Gary L.** 2005. Planned Burn-Piedmont. A local operational numerical meteorological model for tracking smoke on the ground at night: model development and sensitivity tests. *International Journal of Wildland Fire* 14: 85-98.

Baumhauer, Madsen, P., **Stanturf, J.A.** 2005. Regeneration by direct seeding—a way to reduce costs of conversion. Chapter 22 in Stanturf, J.A. and Madsen, P., eds. *Restoration of Temperate and Boreal Forests*. CRC Press, Boca Raton. P. 349-354.

Brockway, D.G., **Outcalt, K.W.**, Tomczak, D.J., Johnson, E.E. 2005. Restoring longleaf pine forest ecosystems in the southern U.S. Chapter 32 in Stanturf, J.A. and Madsen, P., eds. *Restoration of Temperate and Boreal Forests*. CRC Press, Boca Raton. P. 501-519.

Cunningham, P., **Goodrick, S.**, Hussaini, M.Y., Linn, R. 2005. Coherent vortical structures in numerical simulations of buoyant plumes from wildland fires. *International Journal of Wildland Fire* 14: 61-75

Gardiner, Emile S., **Stanturf, John A.**, Schweitzer, Callie J. 2004. An afforestation system for restoring bottomland hardwood forests: biomass accumulation of Nuttall oak seedlings interplanted beneath eastern cottonwood. *Restoration Ecology* 12(4): 525-532.

Haight, Robert G., **Cleland, David T.**, Hammer, Roger B., Radeloff, Volker C., Rupp, T. Scott. 2004. Assessing fire risk in the wildland-urban interface. *Journal of Forestry* 102(7): 41-48.

Hoadley, Jeanne L., Westrick, Ken, Ferguson, Sue A., **Goodrick, Scott L.**, Bradshaw, Larry, Werth, Paul. 2004. The effect of model resolution in predicting meteorological parameters used in fire danger rating. *J. Applied Meteorology*, 43(10): 1333-1347.

Jones, P.D., Schimleck, L.R., Peter, G.F., Daniels, R.F., **Clark, A. III.** 2005. Nondestructive estimation of *Pinus taeda* L. wood properties for samples from a wide range of sites in Georgia. *Canadian J. Forest Research* 35: 85-92

**Kennard, D. K.** 2004. Commercial tree regeneration 6 years after high-intensity burns in a seasonally dry forest in Bolivia. *Canadian Journal of Forest Research* 34(11): 2199-2207.

**Kennard, D. K.**, Rauscher, H. M., Flebbe, P. A., Schmoldt, D. L., Hubbard, W. G., Jordin, B., Milnor, W. H. 2005. Using hyperdocuments to manage scientific knowledge: the prototype Encyclopedia of Southern Appalachian Forest Ecosystems. *Forest Ecology and Management*, 207 (1-2) 201-213.

**Kennard, D.K., Outcalt, K.W., Jones, D., and O'Brien, J.J.** 2005. Comparing techniques for estimating flame temperature of prescribed fires. *Fire Ecology* 1 (1): 75-93.

\***Liu, Y.-Q.** 2005. Enhancement of the 1988 Northern U. S. drought due to wildfires, Geophy. Res. Let., 32 (No. 10).

Long, Alan J., **Wade, Dale D.**, Beall, Frank C. 2004. Managing for fire in the interface: Challenges and opportunities. Chapter 13 in Vince, Susan W., Duryea, Mary L., Macie, Edward A., Hermansen, L. Annie, eds., *Forests at the Wildland-Urban Interface*. CRC Press, Boca Raton. P. 201-223.

**Paladino, J.C.L.**, Guapyassú, M.S., Platais, G.H. 2005. Restoration practices in Brazil's Atlantic rainforest. Chapter 27 in Stanturf, J.A. and Madsen, P., eds. *Restoration of Temperate and Boreal Forests*. CRC Press, Boca Raton. P. 5409-422.

**Stanturf, J.A.** 2005. What is forest restoration? Chapter 1 in Stanturf, J.A. and Madsen, P., eds. *Restoration of Temperate and Boreal Forests*. CRC Press, Boca Raton. P. 3-11.

**Stanturf, J.A.**, Conner, W.H., Gardiner, E.S., Schweitzer, C.J., and Ezell, A.W. 2004. Recognizing and overcoming difficult site conditions for afforestation of bottomland hardwoods. *Ecological Restoration* 22(3): 183-193. (Counted in last year).

**Stanturf, J.A.** and Madsen, P. 2005. *Restoration of Temperate and Boreal Forests*. CRC Press, Boca Raton. 569 pp.

**Stanturf, J.A.** and Madsen, P. 2005. Preface in Stanturf, J.A. and Madsen, P., eds. *Restoration of Temperate and Boreal Forests*. CRC Press, Boca Raton. P. ix-xvii.

Van Lear, D.H. and Wurtz, T.L. 2005. Cultural practices for restoring and maintaining ecosystem function. Chapter 11 in Stanturf, J.A. and Madsen, P., eds. *Restoration of Temperate and Boreal Forests*. CRC Press, Boca Raton. P. 173-192.

### Proceedings and Reports

**Callahan, M.A. Jr.** 2005. Soil biology and fire in southern ecosystems. Encyclopedia of Southern Fire Science, <http://www.forestencyclopedia.net> USDA Forest Service, Southern Research Station.

**Clark, Alexander III** and Daniels, Richard F. 2004. Wood quality of slash pine and its effect on lumber, paper, and other products. In Dickens, E.D., Barnett, J.P., Hubbard, W.G. and Jokela, E.J. eds., *Slash Pine: Still Growing and Growing!* Proceedings of the Slash Pine Symposium held April 23–25, 2002, Jekyll Island, Georgia. USDA Forest Service Southern Research Station; General Technical Report SRS-76, Asheville, NC; pp. 61-65.

**DiCosty, R. J.** 2005. Fire effects on soil organic matter. Encyclopedia of Southern Fire Science, <http://www.forestencyclopedia.net> USDA Forest Service, Southern Research Station.

**Fowler, C.** 2004. *Fire education programs in the Southern United States*. Encyclopedia of Southern Fire Science <http://www.forestencyclopedia.net>. USDA Forest Service, Southern Research Station.

**Fowler, C.** 2004. *Human health and forest fires in the Southern United States*. Encyclopedia of Southern Fire Science <http://www.forestencyclopedia.net>. USDA Forest Service, Southern Research Station.

**Fowler, C.** 2004. *Effects of Fire on cultural resources in the Southern United States*. Encyclopedia of Southern Fire Science <http://www.forestencyclopedia.net>. USDA Forest Service, Southern Research Station.

**Fowler, C.** 2004. *A History of human-caused fires in the Southern United States*. <http://www.forestencyclopedia.net>. Encyclopedia of Southern Fire Science. USDA Forest Service, Southern Research Station.

\*Hao, X., J. Qu, and **Y.-Q. Liu**. 2005. Burned area mapping in eastern United States using MODIS measurements, Proc. of Eastfire, Fairfax, VA, 11-13 May 2005. (Available on CD-ROM)

Helmets, J. and **Fowler, C.** 2004. *Fire in the Wildland-Urban Interface*. Encyclopedia of Southern Fire Science <http://www.forestencyclopedia.net>. USDA Forest Service, Southern Research Station.

**Liu, Y.-Q.**, R. Fu, and R. Dickinson. 2005. The effects of biomass burning on the South American monsoon (extended abstract), in: The Atmospheric Sciences and Air Quality Conference (ASAAQ 2005), San Francisco, April 27-29, 2005, American Meteorological Society, [http://ams.confex.com/ams/ASAAQ2005/techprogram/paper\\_92151.htm](http://ams.confex.com/ams/ASAAQ2005/techprogram/paper_92151.htm).



Myers, R., **Wade, D.**, and Bergh, C. 2004. Fire management assessment of the Caribbean pine (*Pinus caribea*) forest ecosystems on Andros and Abaco Islands, Bahamas. GFI Publication no. 2004-1. The Nature Conservancy, Arlington, VA. 18 pp.

\***Liu, Y.-Q., G. Achtemeier, and S. Goodrick.** 2005. Simulation and experiment of air quality effects of prescribed fires in the southeast, Proc. of Eastfire, Fairfax, VA, 11-13 May 2005. (Available on CD-ROM)

\***Liu, Y.-Q., J. J. Qu, X. Hao, and W. Wang.** 2005. Improving fire emission estimates in the eastern United States using satellite-based fuel loading factors, Proc. of Eastfire, Fairfax, VA, 11-13 May 2005. (Available on CD-ROM)

**Outcalt, Kenneth W.** 2004. Longleaf pine restoration the Hitchiti Experimental Forest. The Southern Restorationist 4(2): 4. (Summer/Fall 2004 issue of the Newsletter of the Coastal Plain Chapter, Society for Ecological Restoration; <http://ser-coastalplains.org/pdfdoc/Summ%20Fall%2004.pdf>)

\*Qu J., X. Hao, R. Yang, S. Dasgupta, S. Bhoi, M. Kafatos, **Y.-Q. Liu, G. Achtemeier, R. Riebau, P. Coronado.** 2005. Bridging EOS remote sensing measurements and fire emissions, smoke dispersion, and air quality DSS in the eastern US, Proc. of Eastfire, Fairfax, VA, 11-13 May 2005. (Available on CD-ROM)

**Reitz, Richard D.** and Geissler, George L. 2003. Community advisor—Firewise. In Proc. Society of American Foresters National Convention, 25-29 October 2003, Buffalo, NY. P. 63-72.

**Stanturf, J.A.,** Gardiner, E.S., Conner, W., Outcalt, K., Guldin, J. 2004. Restoration of southern forest ecosystems. In Rauscher, H.M., Johnsen, K., eds. Southern Forest Science: Past, Present, Future. USDA Forest Service Southern Research Station, Asheville, NC; General Technical Report SRS-75; pp. 123-131.

\*Wang, W., J. Qu, X. Hao, and **Y.-Q. Liu.** 2005. A comprehensive approach for detecting active fire over the southeastern United States, Proc. of Eastfire, Fairfax, VA, 11-13 May 2005. (Available on CD-ROM)

Zhang, Yangjian. 2004. Identification of the wildland-urban interface at regional and landscape scales. Ph.D. dissertation, University of Georgia; 116 pg. (Performed under cooperative research agreement # SRS-02-CA-11330136-182, Wimberly and Stanturf).

## Abstracts and Posters

\***Callahan, M. A., Jr., P. J. Hanson, and D. E. Todd, Jr.** 2005. Tracing 14C labeled leaf litter through oak-hickory forest soils with native or introduced earthworms. Proceedings of Soil Ecology Society Meetings, Argonne National Laboratory, Argonne, IL, May 2005.

**DiCosty, R.,** Kelley, S., Rials, T., **Stanturf, J.A.** 2004. Soil black carbon levels and soil organic matter quality under interval prescribed burning in the southeastern United States. Eurosoil 2004, 4-12 September, Freiburg, Germany [Poster]

**DiCosty, Ralph and Stanturf, John.** 2004. Fifty years of prescribed burning: effects on soil organic matter composition and podzolization in a Spodosol soil profile in the Southeastern United States. Soil Science Society America Annual Meeting Abstracts.

Gardiner, Emile S., **Stanturf, John A.,** Hamel, Paul B., and Leininger, Theodor D. 2004. Early stand development, carbon sequestration, and wildlife use under conventional versus intensive afforestation practices in the Lower Mississippi Alluvial Valley. 22nd Session International Poplar Commission, The Contribution of poplars and willows to sustainable forestry and rural development, Santiago, Chile 29 Nov-2 Dec 2004; p. 96 [Abstract]

**Goodrick, Scott, Liu, Yongqiang, and Stanturf, John.** 2004. Spatial modeling of drought using artificial neural networks. In Impacts of the Drought and Heat in 2003 on Forests, Berichte Freiburger Forstliche Forschung, Heft 57: 18.

**Liu, Y., G. Achtemeier, and S. Goodrick.** 2004. Air quality effects of prescribed fires simulated with CMAQ. The Third Models-3 Workshop, Chapel Hill, NC, 18-20 Oct 2004. (Extended abstract, paper 6.5, pp 1-4, available from [http://www.cmascenter.org/html/2004\\_workshop/abstracts\\_presentations.html](http://www.cmascenter.org/html/2004_workshop/abstracts_presentations.html).)

**Liu, Yongqiang, Stanturf, John, and Goodrick, Scott.** 2004. Modeling ecosystem water stress and fire risk under drought conditions. In Impacts of the Drought and Heat in 2003 on Forests, Berichte Freiburger Forstliche Forschung, Heft 57: 56.

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**Wade, D.,** Brenner, J., Anderson, J., Graham, H., **Goodrick, S.,** Gorden, R., Hebb, M., Kern, J., Kuypers, M., Miller, S., Mousel, K., Proctor, T., and Voltolina, D. 2004. Some considerations when prescribed burning at the Wildland-Urban Interface. Tall Timbers Fire Ecology Conference Proceedings 22:318 [Abstract]



Valea Putnei Forest District hunting lodge in the eastern Carpathian Mountains, Romania.



## Upcoming Events:

### 2005

- Jun 6-10 National Silviculture Workshop, "Restoring fire-adapted forested ecosystems" Granlibakken Conference Center in Tahoe City, California
- Jun 12-16 5th North American Forest Ecology Workshop, Aylmer, Quebec, Canada; <http://www.unites.uqam.ca/gref/nafew2005/>
- Jun 19-22 59th Annual International Convention, Forest Products Society, Quebec City, Canada; Alex Clark to attend and present paper. <http://www.forestprod.org/confam05.html>.
- Jun 20-24 5th International Conference on Forest Vegetation Management, IUFRO Research Group 1.13.00 Forest Vegetation Management, Corvallis, Oregon, USA. <http://outreach.cof.orst.edu/icfvm/index.htm>
- \*Jun 19-22 59th Annual International Convention, Forest Products Society, Quebec City, Canada; Alex Clark to attend and present paper <http://www.forestprod.org/confam05.html>
- Jun 20-23 Southern Forest Tree Improvement Conference (SFTIC), Sheraton Capital Center, Raleigh, North Carolina; <http://www.ncsu.edu/feop/sftic/>
- Jun 27-29 LOICZ II Inaugural Open science Meeting, Egmond aan Zee, The Netherlands (Land Ocean Interactions in the Coastal Zone), Stanturf invited to attend and present paper; [http://www.loicz.org/loica\\_nl/6cfc735ad960dcbcfdd34acaf1981256.php](http://www.loicz.org/loica_nl/6cfc735ad960dcbcfdd34acaf1981256.php).
- Jul 17 – 20 American Society Agricultural Engineers (ASAE) annual meeting, Tampa, Florida; session on Forest Engineering Contributions to Biomass Collection and Transport organized by Bryce Stokes, Email: [bstokes@fs.fed.us](mailto:bstokes@fs.fed.us)
- Jul 18-22 AFFORNORD, Conference on Effects of Afforestation on Ecosystems, Landscape & Rural Development, Reykholt, Iceland; <http://www.skogur.is>
- Jul 26-28 IUFRO Conference "The Thin Green Line," a symposium on the state-of-the-art in reforestation; Thunder Bay, Ontario, Canada; <http://www.forestrenewal.ca/thingreenline>
- Aug 5-7 IUFRO meeting, Improving Productivity in Mixed-Species Plantations, Southern Cross University, Lismore, Australia; contact [dnichols@scu.edu.au](mailto:dnichols@scu.edu.au)
- Aug 7-12 Ecological Society America annual meeting, Montreal, Canada; <http://www.esa.org/montreal/>. Outcalt to attend and present.
- Aug 8-13 IUFRO World Congress, Brisbane, Australia. Stanturf to attend. <http://www.iufro2005.com>
- Aug 29-31 Status, Trends, and Future of the South's Forest and Agricultural Biomass conference, Athens, GA; <http://biomass.sref.info/conference.htm>
- Aug 29-31 White House Conference on Cooperative Conservation, St. Louis, MO; <http://www.conservation.ceq.gov/about.html>.



American dog tick  
*Dermacentor variabilis*



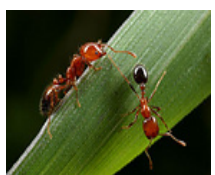
Black legged tick  
*Ixodes scapularis*



Chigger  
*Eulrombicula alfreddugesi*



Brown recluse spider  
*Loxosceles reclusa*



Fire ant  
*Solenopsis xyloni*



Mosquito  
*Aedes sollicitans* (One of several species)



Paper wasp  
*Polistes annularis*



Scorpion  
*Vejovis cardiansis*



Southern black widow  
*Latrodectus mactans*



Southern devil scorpion  
*Vejovis carolinianus*



Southern yellow jacket  
*Vespula squamosa*



Female lone star tick  
*Amblyomma americanum*

As a thinker and planner the ant is the equal of any savage race of men; as a self-educated specialist in several arts she is the superior of any savage race of men; and in one or two high mental qualities she is above the reach of any man, savage or civilized!

Mark Twain  
19th century US author and humorist





## Upcoming Events:

Sep 9-10	Pre-Conference Workshop in association with Pedometrics 2005 Conference, Gainesville, FL. <a href="http://conference.ifas.ufl.edu/pedometrics/#optional">http://conference.ifas.ufl.edu/pedometrics/#optional</a>	<b>2006</b>	
Sep 10-12	European Forestry Institute annual conference and Scientific Seminar "Multifunctional Forest Ecosystem Management in Europe: Integrated approaches for considering the temporal, spatial and scientific dimensions" Centre Tecnològic Forestal de Catalunya (CTFC), Barcelona, Spain	*Jan 29-Feb 2	American Meteorological Society Annual Meeting, Atlanta, GA; <a href="http://www.ametsoc.org/meet/annual/">http://www.ametsoc.org/meet/annual/</a>
Sep 12-14	Pedometrics 2005: Frontiers in Pedometrics, Naples, FL. <a href="http://conference.ifas.ufl.edu/pedometrics/">http://conference.ifas.ufl.edu/pedometrics/</a>	Jan 8-12	"Ecology in an Era of Globalization: Challenges and Opportunities for Environmental Scientists in the Americas," Merida, Yucatan, Mexico; <a href="http://www.esa.org/mexico">www.esa.org/mexico</a>
Sep 12	Fire Prevention - Wildland Urban Interface Exchange Workshop, Birmingham, AL; postponed from May	Feb/Mar	Central Hardwood Forest Conference, Knoxville, TN.
Sep 12-18	Society for Ecological Restoration 17th International Conference, Zaragoza, Spain. <a href="http://www.ecologicalrestoration.net">http://www.ecologicalrestoration.net</a>	*March 27-30	"Fuels Management -- How to Measure Success" conference sponsored by the International Association of Wildland Fire (IAWF), Portland, OR; <a href="http://www.iawfonline.org">www.iawfonline.org</a>
Sep 20-21	NOAA/EPA Golden Jubilee Symposium on Air Quality Modeling and Its Applications, Durham, NC.	Mar 29-Apr 2	American Society Environmental History Annual Meeting, St. Paul, Minnesota; <a href="http://www.h-net.org/~environ/ASEH/conferences.html">http://www.h-net.org/~environ/ASEH/conferences.html</a>
Sep 25-30	MEDPINE 3: International Conference on Conservation, Regeneration and Restoration of Mediterranean Pines and their Ecosystems, MAIB, Mediterranean Agronomic Institute of Bari - Valenzano (Bari), Italy. For further information contact: Angela Inchingolo or Elvira Loiudice ( <a href="mailto:loiudice@iamb.it">loiudice@iamb.it</a> )	Apr 8-12	International Conference on Hydrology and Management of Forested Wetlands, New Bern, North Carolina; <a href="http://www.asae.org/imis/meeting/forestcall.cfm">http://www.asae.org/imis/meeting/forestcall.cfm</a>
Sep 27-Oct 1	Workshop and meeting of the Scandinavian Disturbance Network, "The scale of natural disturbances from tree to stand," sponsored by Lithuanian Forest research Institute and Institute of Forestry and Rural Engineering of Estonian Agricultural University; Vilnius and Palanga, Lithuania	Jul 9-15	18th World Congress of Soil Science, in Philadelphia, PA <a href="http://www.18wcss.org">http://www.18wcss.org</a>
Oct 9-13	2nd International Conference on Mechanisms of Organic Matter Stabilization and Destabilization in Soils, Asilomar California, <a href="http://www.data.forestry.oregonstate.edu/SoilConf">http://www.data.forestry.oregonstate.edu/SoilConf</a>	*Aug 8-10	Forest and Water in a Changing Environment Beijing, China; Chinese Academy of Forestry, Beijing Forestry University and Southern Research Station.
Oct 15-20	International conference on "Metal fluxes and their stress on terrestrial ecosystems," Centro Stefano Franscini, Monte Verità, Ascona, Switzerland; <a href="http://www.waldschutz.ch/bioindic/monte_verita/">http://www.waldschutz.ch/bioindic/monte_verita/</a>	Oct 25-29	Society American Foresters Annual Meeting, Pittsburgh, PA
Oct 17-19	23rd Tall Timbers Fire Ecology Conference "Fire In Grassland and Shrubland Ecosystems", Bartlesville, OK; <a href="http://www.talltimbers.org">http://www.talltimbers.org</a>	Nov 12-16	Soil Science Society of American Annual Meeting, Indianapolis, IN; <a href="http://www.indy.org">http://www.indy.org</a>
Oct 19-23	Society American Foresters Annual Meeting, Ft. Worth, TX, Outcalt to attend and present.	Nov 27-30	V International Conference on Forest Fire Research, Coimbra, Portugal <a href="http://www.fire.uni-freiburg.de/course/meeting/meet2004_25.htm">http://www.fire.uni-freiburg.de/course/meeting/meet2004_25.htm</a>
*Oct 20	Workshop on Fuels Treatments and Restoration of Longleaf Pine, Solon Dixon Forestry and Education Center, Andalusia, AL Outcalt, Outcalt, and Revell to present and attend.	<b>2007</b>	
Nov 6-10	Soil Science Society of American Annual Meeting, Salt Lake City, UT	Feb 26-Mar 1	14th Biennial Southern Silvicultural Research Conference, Savannah, GA;
Nov 7-11	IUFRO Tree Biotechnology 2005 Meeting, Pretoria, South Africa <a href="http://www.iufro.up.ac.za">www.iufro.up.ac.za</a> .	Oct 24-28	Society American Foresters Annual Meeting, Portland, OR.
Nov 15-17	Fire in Eastern Oak Forests: Delivering Science to Managers, Ohio State University, Columbus, OH; contact Matt Dickinson <a href="mailto:mbdickinson@fs.fed.us">mbdickinson@fs.fed.us</a>	Nov 4-8	Soil Science Society of American Annual Meeting, New Orleans,
		<b>2008</b>	
		Nov 5-9	Society American Foresters Annual Meeting, Reno, NV.LA; <a href="http://www.neworleanscvb.com">http://www.neworleanscvb.com</a>



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## *GPRA -Accomplishment*

Category	FY 2004 Total	FY 2005 Total
Number of Refereed Journal Publications	20	18
Number of Non-Refereed Publications (include abstracts)	89	30
Number of Publications (refereed + non-refereed)	109	48
Number of Tours	41	35
Number of Short Courses/Training	20	8
Number of Invited Presentations to Scientific Organizations	12	6
Number of Invited Presentation to Lay Organizations	30	23
Volunteer Presentations to Scientific Organizations (non-GPRA	42	45
Number of Technology Transfer Activities (other than above)	105	115
Outside Funding	\$2,610,574	\$3,374,469

### SRS-4104 Project Leader's Report

John Stanturf - Editor Lynne Breland - Technical Writer  
Patricia A. Outcalt - Production, Design and Layout

